My house here stands in a fairly open and elevated position, about 155 ft. O.D., with no higher ground in the immediate vicinity, or between me and Ypres. Many of my neighbours, who live in similar situations, also hear the sound, and recognise clearly what it is. It seems much less audible at lower elevations, and quite inaudible among houses. For instance, I cannot hear of its ever having been heard in the adjacent town of Chelmsford, or in any part of London.

MILLER CHRISTY.

Broom Wood Lodge, Chignal St. James,
Chelmsford, October 19.

The Cumberland Earthquake of October 2.

I WAS interested to read the note in NATURE of October 21 (p. 208) referring to an earthquake in the Lake District, Cumberland, on October 2, at 3.15 a.m. My wife and I spent some weeks at Seatoller, Borrowdale, leaving on October 2. Early in the morning of that day we were awakened by a strange noise and the house vibrating. The noise and vibration were so completely similar to what occurs in my own house when the hot-water boiler is overheated and steam, condensing in the pipes, causes "hammering," that I was on the point of getting up to turn on the bathroom tap, when it ceased. As we were leaving in the morning the proprietors inquired if we had heard the noise in the night, and I replied at once that I had heard the hammering in the pipes of the hot-water system, but was told that it was quite impossible for the water to have been hot at the time. I had no idea of the true explanation until I read the note referred to. Seatoller is about 30 miles S.S.W. of Carlisle and 4½ miles N.N.E. of Scafell Pike. Possibly it may be of interest to record that at this place the earthquake was accompanied by concussions and vibrations sufficient to waken the inhabitants.

FREDERICK SODDY.

October 23.

The Etymology of "Chincough."

WHOOPING-COUGH is, or used to be, called in the south of Scotland, "chincough," but the "ch" was hard, so that it sounded kincough, or kink-cough. In Jamieson's Scottish Dictionary the word "kink" has the meanings (1) a violent fit of coughing attended with suspension of breathing, (2) a regular fit of the chincough. "To kink" is to labour for breath in a severe fit of coughing. The more purely Scottish word for whooping-cough is "kinkhost," in the Belgic language *kink-hoest*.

L. B.

October 23.

THERE can, I think, be no doubt that "chincough" is a good English word, meaning whooping-cough and nothing else. It has nothing to do with *chien* (a dog), as Mr. Hart supposes (NATURE, October 21), or with chin, although to anyone who has noticed the depression and thrusting forward of the lower jaw during a paroxysm this derivation might seem probable. The word is, according to Skeat, properly chink-cough, and in Scotland and some parts of England a paroxysm is called a kink, which, again according to Skeat, means a catch in the breath, from kik, or kuk, to gasp, an imitative word, which is also the base of cough. The term kinkhost, still in use in Scotland, resembles the German equivalent, *keuchhusten*, which is also imitative. The French *coqueluche* is more puzzling, but probably has reference to the crowing inspiration which follows the expiratory spasm.

DAWSON WILLIAMS.

London, October 22.

As your correspondent (NATURE, October 21) points out, chincough has certainly nothing to do with "hiccough"; but has it anything to do with the French *chien* = a dog, as he supposes? Chincough is the softer English equivalent of the Scotch kink-host (Dutch, *kink-hoest*). Besides, the noun there is also the verb, to kink (O. Dutch, *kinken* = to cough), and even an Englishwoman, at least in the north, who calls the disease whooping-cough, will tell one when her child began to "kink" with its cough. My dictionary compares the word with the Anglo-Saxon "cincung" = a fit of laughter, and kink is sometimes also used in that sense, or in connection with any choking inspiratory spasm. Finally, there is nothing in the sound of whooping-cough to suggest a dog, though the cough of croup might do so.

M. D.

Longitudes of Two Markings on Jupiter.

IN NATURE of October 14 the longitudes of the S. Tropical Disturbance and the Red Spot which I gave should be in each case minus 75·14°, if they are to correspond with the adopted period of System II. :—

S. Tropical Disturbance

Date 1915	P. end	f. end
Sept. 11	313·1°	—
13	310·8°	—
20	308·4°	—
21	—	42·6°
26	—	37·7°
28	—	36·5°
30	305·3°	35·3°
Oct. 1	—	34·6°

Red Spot Hollow

Date 1915	P. shoulder	f. shoulder
Sept. 10	—	185·1°
12	149·5°	—
17	149·1°	186·0°
19	148·9°	187·6°
27	—	185·1°
29	—	185·1°

SCRIVEN BOLTON.

CHINESE DEFENSIVE ARMOUR.[1]

THE somewhat ponderous title of the work before us rather obscures the subject of this monograph, which is upon the origin and history of defensive armour, a theme of considerable cultural importance and here treated systematically for the first time. As a result, we have a masterly description of Oriental protective armour, and suggestive fresh light is also thrown upon certain sources of early Chinese civilisation.

The research is based primarily upon a large collection of ancient Chinese clay figures dug up (apparently by the author) from graves in the provinces of Shen-si and Ho-nan during the years 1908–1910, and deposited among the rich collections from the Far East now in the Field Museum of Natural History at Chicago, of which the author is a well-known curator and field-explorer.

The hides of the archaic Chinese cuirasses of the pre-metal age are ascribed by ancient tradition to two animals named respectively *Se* and *Si*, which are identified by the majority of sinologists with one or two species of rhinoceros. Dr. Laufer, who combines with his scientific physical training also a scholarly knowledge of Chinese, revises the Chinese texts at first hand, and appears to substantiate his identification of the *Se* as the single-horned and the *Si* as the two-horned Sumatran rhinoceros. In addition to the mass of mythological and folk-lore references to

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[1] "Chinese Clay Figures." Part i., Prolegomena on the History of Defensive Armour. By B. Laufer. Field Museum of Natural History Publication 177, Anthropological Series, vol. xiii., No. 2. Pp. 69–315+64 plates. (Chicago: Field Museum of Natural History, 1914.)

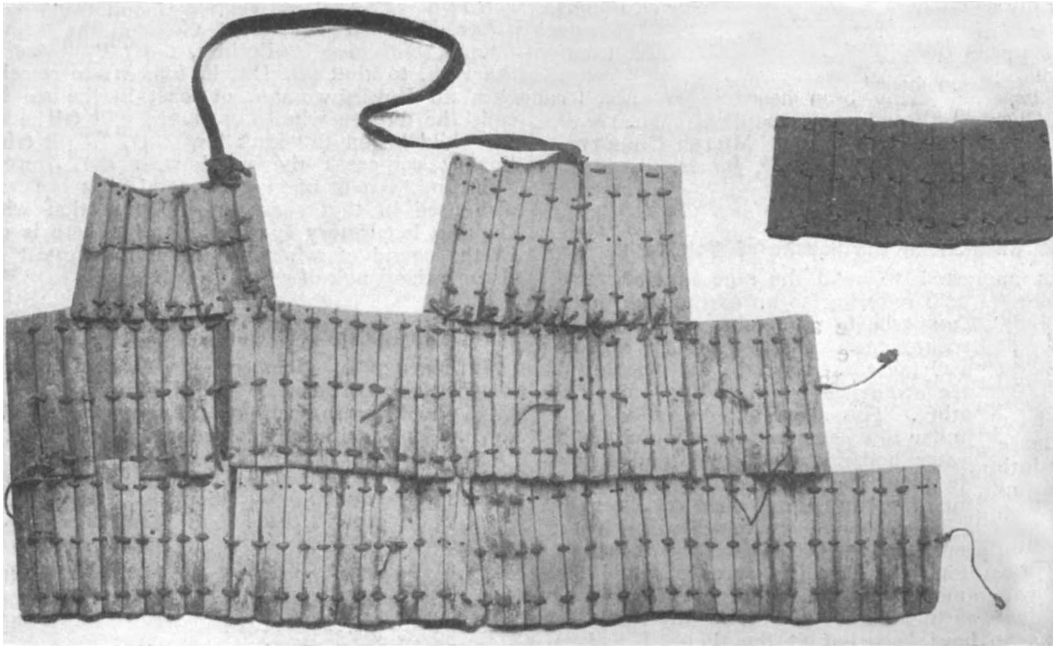

FIG. 1.—Eskimo armour of ivory plates and fragment of iron plates. From "Chinese Clay Figures."

these animals extracted from ancient literature and art, Dr. Laufer has elicited historical references to these animals, as royal presents and otherwise, in the official annals, which are important as indicating some chronology for the former geographical range of these animals in northern China and central Asia, where they have long been extinct. It appears that the two-horned (or Sumatran?) rhinoceros no longer existed within China proper in the first century A.D., and was only to be found to the south of the Yangtse; while the one-horned species survived in China in the Upper Yangtse valley down to the Middle Ages. In connection with the former range of these animals we would suggest that the Arabic name "*Kargadan*" is obviously cognate with the Indian title for the rhinoceros, which in the Sanskrit is "*Khadga*," which means literally "the cutter," or "sword," evidently with reference to the horn.

The association of the rhinoceros with the myth of the unicorn is examined in great detail; also the mystic use of the horn as anti-poison goblets up to the present day in China. It appears to us possible that this latter use was derived from India, or at least through false etymology by confusing the Sanskrit name for "horn," namely *Vishāna,* with the Sanskrit word for "poison," namely, *Visha*; for the Chinese are known to have called the rhinoceros-horn in the eleventh century A.D. by the name *pi-sha-na* (Wylie, "Notes," 195), their version of the Sanskrit word. This false etymology would also readily lend itself to the astrological view that the horn of the rhinoceros symbolised the ascending node, and as such represents hostility to the powers of darkness, and as a poison-destroyer. In this regard it is perhaps noteworthy that there seems to us a suggestion of purity also (or is it phallic?) in respect to the armorial unicorn, which, according to the legend, was only to be caught at the lap of a virgin maid. It is clear, however, that Pliny ("Nat. Hist.," 8, 21), who must have been

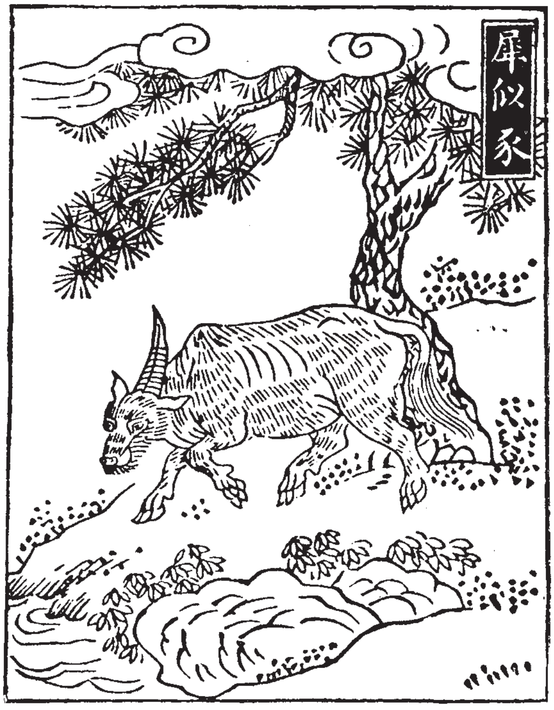

FIG. 2.—The animal "*Si* resembling swine" (from the illustrated edition of *Erh ya*). From "Chinese Clay Figures."

familiar with the rhinoceros in the circus, did not identify it with his fierce *mono-ceros* or unicorn.

In connection with the use of rhinoceros hide as armour, it is recalled that it is only when the skin is dried and properly prepared that it becomes of iron-like hardness; for the skin of the living animal, notwithstanding popular hunters' tales to the contrary, is quite soft and can be readily penetrated in any place by a bullet or easily pierced by a hunting knife.

We have not space here to follow the author in his exhaustive account of the origin and development of defensive armour. He treats of this in long chapters devoted to "Defensive Armour of the Archaic Period" (B.C. 1122–255), characterised by hide cuirass and scale armour in which metal was absent; "Defensive Armour of the Han Period" (beginning in the third century B.C.), when metal (at first copper and latterly iron) scales were introduced, from Persia, Dr. Laufer believes, to form "plate" armour; "Chain and Ring Mail," also from Persia, though this was confined to the Arabs and Moghuls and Tibetans, and never adopted by the Chinese; "Plate" armour, which was much more ancient and at first formed of bone-plates; "Sheet" armour, as in the medieval West, first came into use in China in the Tang period (A.D. 618–906), and from India, the author seems to believe. A chapter is also devoted to "Horse-Armour," shedding much new light upon this interesting phase of protective armament.

A word of high praise must also be given to the illustrations, which are well chosen and significant; and the photographic plates, sixty-four in number, are beautifully reproduced.

L. A. WADDELL.

MODERN BULLETS IN WAR AND SPORT.

FOUR interesting articles appeared in the columns of *Engineering* in August of this year, contributed by Fleet-Surgeon C. Marsh Beadnell, and these have now been reprinted in the form of a thin pamphlet. The articles are full of information as to the weights and velocities of different bullets and as to the effects of bullets of different kinds when they strike various substances at different points in their trajectory. The great experience of the author as a big-game sportsman on the one hand and as having seen many cases in the South African and Philippine wars and the present war on the other give great value to his observations on the destructive or at times very slight effects produced by the modern bullet; his treatment of the dynamical and especially of the aerodynamical principles affecting the motion of projectiles is less satisfactory.

In dealing with the effects of bullets the author shows how the damage done depends on the energy lost by the bullet; how, for example, a bullet at a high velocity and striking properly end-on may drill a clean hole, doing the minimum of damage and losing but little of its velocity, while at a later stage of its flight when travelling more slowly, and especially if in any degree inclined to its trajectory, the destruction is incomparably greater, and the loss of energy as represented by v^2 equally so.

> The following experiment will exemplify this fact:—Two skulls were filled with a substance of a consistency as near as possible to that of the brain. Against the one was fired a normal bullet at high velocity, against the other a similar bullet at low velocity, this being effected by using a quarter charge; the range in each case was 10 ft. The first skull was neatly perforated, and the bullet, unaltered in shape, was found embedded 26 in. in the wood backing; the second skull was partly disarticulated, and was fractured posteriorly, the bullet lying inside against its posterior wall. In the case of the first skull the bullet parted with but little of its energy, and that only at the actual points of entry and emergence. In the case of the second skull more of the bullet's energy, both absolutely and relatively, was expended on it and its contents.

In an experiment of this sort a good deal depends on the compressibility of the material filling the envelope. As illustrating this point it may be permitted to refer to an experiment made by the writer of this notice at the time that he was photographing bullets. In order to ascertain if it would be practicable to photograph a bullet glancing off still water, he constructed a long trough of thin wood open at the top, somewhere about 3 ft. long and 4 or 5 in. wide and deep, and on to the water in this he fired a 0·303 bullet at as near a grazing incidence as he could. The water was hit about two-thirds along the trough, and was driven out as by an explosion. The front and sides of the trough in advance of the point of striking were split into matchwood, and generally, apart from the photographic difficulties, it seemed desirable to experiment in other directions.

The author has experimented on the inclination at which the modern high-speed bullet will penetrate a skull, and found that at angles above 5° or 6° he obtained penetration, whereas Snider and Martini bullets would glance off at much greater angles. Space does not allow of reference to the numerous valuable observations of the author on the curious effects of bullets both in big game and in warfare. These will be read with the greatest interest. It is not possible, however, to follow the author in his excursions in the domain of pure dynamics, and his treatment of the action of the air on the projectile appears to the writer to be very largely imaginary and incorrect. So difficult a subject as the action of air upon a rotating projectile, whether spherical or elongated, and whether the axis of spin is in or across the trajectory, scarcely admits of any but the most rigid treatment, and in this the author might find Mr. Crabtree's admirable book illuminating. There is a statement which is new to the present writer, and it would have been well to have given the authority.

> Thus, up to speeds of 790 ft. per second resistance varies as the square of the speed, between 790 and 990 ft. per second as the cube, between 990 and 1120 ft. per second as the sixth power, between 1120 and 1330 ft. per second again as the cube, and above 1330 ft. per second again as the square of the speed; above 1500 ft. per second the relationship is not known.

C. V. BOYS.